UTAH'S

Energy Action Plan Through 2020







GOVERNOR'S OFFICE OF ENERGY DEVELOPMENT

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ACKNOWLEDGMENTS

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DISCLAIMER

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GARY R HERBERT
GOVERNOR

Office of the Governor Salt Lake City, Utah 84114-2220 SPENCER J. COX LIEUTENANT GOVERNOR

May 15, 2018

Dear Reader,

It is no secret that Utah has one of the nation's best economies and highest quality of life, and affordable and reliable energy plays a crucial role in Utah's successful formula. Responsible energy and minerals development provide an essential cornerstone of Utah's economy. Along with supporting a vibrant economy with affordable energy, energy and minerals production create high-paying jobs—many of which are located in rural Utah.

Utah is an energy- and minerals-rich state. We have significant reserves of petroleum, natural gas and coal, as well as abundant renewable resources, including solar, wind, and geothermal. Utah also hosts significant non-energy minerals, including copper, silver, molybdenum, and others. As we look toward the future, we must thoughtfully consider how to most effectively leverage Utah's resources to sustain economic growth while also meeting our environmental goals.

For this reason, my Office of Energy Development and the Energy Advisory Council developed a roadmap for Utah's energy future based on an all-of-the-above approach to responsible energy development. It is my pleasure to present to you the Utah Energy Action Plan.

As we combine the Energy Action Plan's balanced approach to resource development with Utah's powerful spirit of innovation and collaboration, we will enable sustainable growth and continued prosperity for generations to come.

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Gary R. Herbert Governor

UTAH'S ENERGY ACTION PLAN

ON PLAN



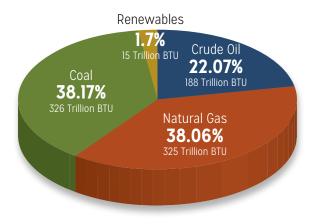
Energy impacts Utah's quality of life in many ways. Affordable energy helps maintain a lower cost of living, allowing Utah's residents and businesses to have more flexibility in their budgets for spending, investing and saving. Additionally, energy and minerals production can continue to provide abundant opportunities for jobs and economic development in the state, especially in many of Utah's rural communities.

As Utah's population is set to nearly double by 2050, our energy demands will increase. Even with Utah's expected growth, clean air, water and other important state environmental goals can be achieved alongside state goals for advancing responsible energy and minerals development.

To that end, the Utah Energy Action Plan has been developed to help OED meet its objectives and deliver results to the residents of Utah through a disciplined approach to the management and execution of its programs. This document outlines the following goals:

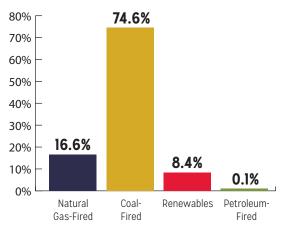
- 1. Target Rural Business Development
- 2. Support Energy Research, Demonstration and Development Initiatives
- 3. Expand Education Initiatives
- 4. Continue to Organize Energy and Minerals Events
- 5. Continued Improvement in Utah Energy Efficiency Investments
- 6. Infrastructure Development for Alternative Fuels
- 7. Engage in Policy and Regulatory Matters
- 8. Expand Regional Engagement
- 9. Increase All-of-the-Above Energy Communications
- 10. Advance the Air-Energy Nexus

2017 Utah Energy Mix



Created by the Kem C. Gardner Policy Institute

Utah Electric Generation Mix, 2017



Energy Information Administration

BACKGROUND

Governor Herbert's 10-Year Strategic Energy Plan ("the Plan"), released in 2011 and updated in 2014, created a roadmap for Utah's energy future based on an all-of-the-above approach to responsible energy development. It was the product of a collaborative effort led by the Governor's Energy Task Force in cooperation with diverse stakeholders across Utah

The Governor's Office of Energy Development (OED), a recommendation of the Plan, was established in 2012 to advance Utah's energy and mineral economy by:

- supporting investment and job creation;
- · advancing energy education; and
- maintaining affordable and sustainable energy.

OED has successfully partnered with stakeholders in industry, academia and government to fulfill its mission. Specifically, the Office has:

- created market-based incentive programs to encourage new investment;
- produced energy education curriculum;
- teamed with industry to offer a postsecondary scholarship program;
- worked to limit the impacts of increased federal energy regulations; and
- supported significant investment in energy efficiency.

ENERGY ACTION PLAN DETAILS

Over the coming years, OED remains committed to continued collaboration with our partners to achieve strategic and targeted breakthroughs in business development, rural job creation, energy policy, education and workforce development in the energy and minerals sectors. The specific

Original Goals of the 10-Year Strategic Energy Plan

- Meet projected energy growth demands in a balanced and responsible manner
- 2. Ensure Utah's continued economic development through access to our own clean and low-cost energy resources
- 3. Develop new, cutting-edge technologies
- 4. Create new and support energy-related manufacturing opportunities
- 5. Update the regulatory environment to support today's business needs
- 6. Promote energy efficiency, conservation and peak consumption reductions
- 7. Facilitate expansion of responsible development of Utah's energy resources
- 8. Pursue opportunities to export Utah fuels, electricity and technologies
- Enhance partnerships among industry, universities, local communities and government
- 10. Collaborate with other Western states to present a strong, unified voice to federal regulatory agencies

goals detailed in the Energy Action Plan will help the Office continue to advance the strategy outlined in the Governor's 10-year Strategic Plan. Goals for accelerating this strategy and Utah's energy and minerals economy are described in the following sections.

Target Rural Business Development

The goal is to increase energy and mineral development in rural counties. OED's business development strategy will leverage partnerships to encourage and compete for global private investment projects utilizing its performance-based incentives and financing programs across Utah's diverse energy resources. OED's development team will coordinate with partners to realize new energy and minerals investment across all resources, including targeted infrastructure development, resource integration and environmental stewardship.

Targeted opportunities include increasing market access for energy and minerals resources by supporting new infrastructure and logistics opportunities with one new oil pipeline by 2020, expansion of natural gas infrastructure, energy storage and coal port access.

Utah is home to high value renewable, conventional and unconventional resources.

OED has provided leadership and support for identifying advanced utilization of coal resources for a variety of combustion and non-combustion purposes that promote new economic opportunities, positive environmental outcomes, and sustainable utilization of Utah's high-quality resource. Additionally, OED is coordinating across numerous projects for



integrated renewable energy development, including solar, geothermal, wind, biomass, energy storage and other emerging renewables.

ACTIONS:

- Effectively convene stakeholders, leverage incentive tools and dedicated funding to support the commercial-scale deployment of three advanced coal projects in rural Utah
- Realize a solar-battery system in rural Utah by 2019
- Develop and support electric system storage options, including other battery technologies and large-scale options
- Promote infrastructure development to support conventional, non-conventional and renewable resources
- Realize approval of at least five High Cost Infrastructure Tax Credit (HCITC) applications annually, with a targeted combined portfolio of investment of \$250 million annually
- Utilize the Production Tax Credit (PTC) and Alternative Energy Development Incentive (AEDI) to grow alternative energy development options in rural Utah
- Pursue core development activities, including manufacturing and non-fuel mineral opportunities
- Promote an all-of-the-above approach to energy resource options to enhance energy reliability and affordability
- Establish a formal partnership to better manage Utah forests by finding a viable market for invasive tree species

OED PARTNERS

- Seven County Infrastructure Coalition
- County Commissions and Economic Development Advisors within targeted counties
- Regional State Energy Offices as defined through projects
- Governor's Office of Economic Development and World Trade Center Utah
- Kem C. Gardner Policy Institute, Energy and Minerals
- State of Utah School Trust Lands Administration
- Utah Mining Association
- Utah Petroleum Association
- · Utah State Department of Agriculture
- Utah State Department of Natural Resources
- Energy storage providers
- Association of General Contractors
- Utah State Division of Facilities Construction and Management
- Associated industry partners
- Utah Manufacturing Association
- · Rocky Mountain Power

MEASURES

- Number of direct, indirect and induced jobs created
- Total and incremental change in dollar amount of private investment leveraged as a result of OED engagement
- Number of development projects OED is engaged in and recognized in its annual report
- Number of development projects brought to fruition annually
- Number of HCITC applications received, in process, approved and contracted
- Number of PTC applications received, in process and approved
- Number of AEDI applications received, in process and approved



An example of how energy development can provide other important benefits to the State is the creation of biomass fuel stock from pinyon-juniper. In addition to serving as a source of energy, this form of biomass can enhance the environmental ecosystem by clearing an invasive tree species and reducing fire risk.

Support Energy Research, Demonstration and Development Initiatives

This goal seeks to create jobs and promote energy innovation through research initiatives. An opportunity exists for the state to realize the creation of a National Observatory for energy research and development. The U.S. Department of Energy plans to select one site to receive \$130 million for a field laboratory that will enable cutting-edge research, drilling and technology testing for enhanced geothermal systems (EGS). EGS has significant resource potential that can reinforce energy resiliency. Utah's University of Utah and Sandia National Laboratories were selected for phase 2 and will compete for the final phase 3 in 2018.

Ultimately, this work would support ongoing innovation in geothermal, oil and gas exploration and other associated energy and minerals extraction opportunities and the development of Utah's renewable energy portfolio.

ACTIONS

- Support FORGE grant opportunity by:
 - Letters to Congressional delegation

- Video on FORGE Site Development by February 28, 2018
- Video on FORGE Research and Results by April 1, 2018
- Infographic
- Financial and jobs analysis
- Identify other funding streams to support FORGE grant (OED cost match, private)
- Geothermal Lesson Plan, Educational Seminars, Modules, and Fact Sheets (complete)
- Support hydrogen research and other renewable energy development
- Identify innovation funding and cooperative agreement opportunities, including new options and those offered through OED partner agencies
 - Realize four to six innovation grants annually



OED TEAM AND PARTNERS

- OED's Renewable Energy and Education Coordinator and OED development team
- University of Utah, Energy and Geoscience Institute
- Utah Geological Survey
- · Idaho National Laboratory
- State of Utah School and Institutional Trust Lands Administration
- United States Geological Survey
- · Utah Department of Environmental Quality
- · Utah Division of Water Rights
- · Rocky Mountain Power
- · Geothermal Resource Group
- · County and City governments
- Geothermal industry
- · Advanced Coal Research Group
- · Governor's Office of Economic Development
- USTAR

- \$4 million in grant dollars CY 2016-18
- OED funding of at least \$20,000
- U.S. Department of Energy total funding to date \$2 million for phase 1 and \$29 million for phase 2
- U.S. Department of Energy funding for phase 3, \$130 million in June 2018
- · State and private funds leveraged
- · Staff employed
- · Number of student participants
- Number of new energy grants awarded annually



Expand Education Initiatives

Expand and enhance energy and minerals education to help build the workforce needed to fill the energy and minerals jobs of the future. This goal will be realized through the following actions.

ACTIONS:

- Expand and enhance OED education materials (contracts with National Energy Foundation and SpyHop Phase II Productions)
- Promote and administer the OED Energy Workforce Scholarship Program to support Applied Technology Colleges (ATC) and Utah colleges and universities
- Deliver annual events that include: Energy & Minerals Days at STEM Fest and the Utah Energy Career Expo
- Promote STEM training through Greenpower Electric Car Challenge
- Deliver at least one annual teacher training to be provided at the Governor's Energy Summit beginning in 2018. The target is 100 teachers educated annually.
- Coordinate with industry to improve education materials and create opportunities for industry-led classroom presentations



OED TEAM AND PARTNERS

- · OED Energy Education Team
- Chevron
- Division of Oil, Gas and Mining (DOGM)
- Utah School and Institutional Trust Lands Administration
- · Rocky Mountain Power
- · Dominion Energy
- · National Energy Foundation
- · SpyHop Phase II Productions
- Utah Mining Association
- Utah State University, Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP)
- Andeavor
- · Chevron

- Number of constituents educated through OED events and materials
- Number of K-12 lesson plans developed and made available to K-12 teachers
- Number of students enrolled in energy- and minerals-related programs at Utah ATCs and universities and colleges
- · Graduation rates
- · Job placement rates
- Scholarship funding, with goal of providing \$30,000 in scholarships in 2018
- · Number of scholarship applications
- · Number of scholarships awarded
- · Dollar amount of scholarships awarded

Continue to Organize Energy and Minerals Events

As the youngest, fastest growing, innovative and best state for business in the U.S., Utah aims to be the global hub for new energy solutions that meet the needs of urban and rural communities across the world. Since its premiere in 2011, the Governor's Energy Summit has played a critical role in knitting together diverse perspectives of government, industry, research, and education, which has helped build key relationships and allowed OED to identify new opportunities for energy development and technologies at home and abroad.

ACTIONS

- Deliver the annual Governor's Energy Summit: Crossroads of Global Innovation with a target of 1,400 attendees in 2018. The Summit will expand in 2019-2020 to include another day dedicated to local sustainability goals.
- Provide for Continuting Legal Education credit at annual events

OED STAFF AND PARTNERS

- · OED Communications Director and staff
- Utah Media Group
- · SpyHop Phase II Productions
- Industry Partners
- State Agencies
- · University Partners
- Kem C. Gardner Policy Institute: Energy and Minerals
- Colorado Mesa University Unconventional Energy Center
- · Other state Governors' and energy offices

- · Ute and Navajo Indian Nations
- Regional groups
- · Federal delegation and agencies
- · International delegations and agencies
- Local energy and mining associations
- · Utah Mining Association
- · Utah Petroleum Association
- · County Commissioners and City Governments

- · Number of attendees
- Number of states in attendance
- · Number of countries in attendance
- Number of state energy offices in attendance
- · Number of regional entities in attendance
- · Number of C-Suite leaders in attendance
- Private funding raised (and diversity of funding raised)
- · Press coverage
- Advertising analytics across social media, print, and broadcast campaigns



Continued Improvement in Utah Energy Efficiency Investment

Since 2015, Utah has improved its ACEEE energy efficiency ranking by 9 points, moving from the 26th most energy efficient state to 17th. Continued improvement in energy efficiency drives new investment and jobs while also positioning Utah to sustainably meet the needs of a fast-growing population.

ACTIONS

- Realize building upgrades through C-PACE and U-Save programs, targeting three C-PACE upgrades annually and one U-Save project with a goal of \$2.5 million in new building investment in 2018 and increasing by \$1 million annually as the programs grow
- Complete 2018 ACEEE scorecard survey and review
- Run press release upon 2018 scorecard announcement

OED STAFF AND PARTNERS

- OED's Managing Director of Energy Efficiency and Renewable Energy and staff
- · Public Service Commission
- · Rocky Mountain Power
- · Dominion Energy
- · ACEEE
- · UAMPS
- · UMPA
- Universities

- OED ranking in 2018, 2019 and 2020
- Press coverage
- Number of U-Save applications received, in process and approved
- Number of C-PACE applications received, in process and approved
- New energy efficiency investment
- · Number of jobs



Infrastructure Development for Alternative Fuels

Advancing transportation opportunities and improving public understanding and awareness of transit options is a key component of diversifying and growing Utah's energy systems, maintaining a high standard of living, increasing efficient and low-cost transport options and improving air quality. This initiative supports the conversion of high use mid- and heavy-duty delivery trucks and vans, public vehicles and buses to compressed natural gas, electric vehicles (EV), Tier 3 fuels or other low-emission emitting fuel sources. As a result of this diversification of Utah's transportation fleet, support for low-emission options will continue along within the transportation corridors.

ACTIONS

- Increase education and utilization of Utah's established CNG corridor
- Increase fleet diversification with CNG, propane, diesel, and EVs

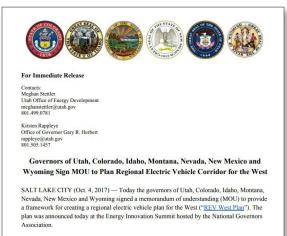
- Install EV infrastructure along Utah's major interstates to build out the Mighty Five® EV Corridor
- Partner with Utah Clean Cities Coalition and Leaders for Clean Air to educate and promote workplace charging and idle free
- Promote grants and incentives to support EV infrastructure installations by public and private entities
- Designate statewide signage to direct EV users to charging stations and EV parking spaces
- Promote access, compatibility, and interoperability of the plug-in EV charging networks across the state and western region to deliver on the Regional EV Plan for the West ("REV West Plan")
- Enhance rural transportation systems
- Proper counting and tracking of EVs and PHEVs by the Utah Tax Commission and DMV
- Support Rocky Mountain Power's Live Electric campaign



OED STAFF AND PARTNERS

- OED Emergency Management and Transportation Specialist
- · Rocky Mountain Power
- State Energy Offices (AZ, CO, ID, MT, NM, NV, WY)
- · Utah Clean Air Partnership
- · Leaders for Clean Air
- · Utah Clean Cities Coalition
- Utah Transit Authority
- Utah Department of Transportation
- · Transportation and fuels manufacturers
- Utah Department of Environmental Quality
- · Utah Division of Fleet Operations
- · Utah Clean Energy





MEASURES

- Increased public awareness of transportation options through three annual events
- Number of charging and fueling stations installed in Utah
- Private and public investments in transportation and fuels
- EV registrations and total number in State.

REV West Plan Actions

- Create best practices and procedures that will enhance EV adoption
- Create voluntary minimum standards for EV charging stations,
- Identify and develop opportunities to incorporate EV charging station infrastructure into planning and development processes, such as building codes, metering policies, and renewable energy generation projects
- Encourage EV manufacturers to stock and market a wide variety of EVs within the Signatory States; and
- Identify, respond to, and where possible collaborate on funding opportunities to support the development of the REV West Plan.

Engage in Policy and Regulatory Matters

OED will engage to support specific, targeted federal and state policies that reduce barriers to energy and mineral development, especially focused on rural Utah. OED will promote a balanced approach to implement incentives that will support innovation across all resources.

ACTIONS

- Provide written comments on proposed policies that could have a material impact on Utah's economy and resources (e.g., Clean Power Plan, Regional Haze Rule, Federal Coal Lease Policy)
- Represent Utah's interests at industry meetings
- Collaborate with other Western states to promote energy and minerals policy decisions that meet the needs of the region

OED STAFF AND PARTNERS

- OED Director, Deputy Director and Development Managers
- · PLPCO
- · Utah Department of Environmental Quality

- · Utah Division of Oil, Gas and Mining
- Industry
- Federal Partners

- Improved access to Utah resources, including renewable and conventional energy sources
- Energy prices in Utah compared with other states (kWh or BTU)
- The trend of energy production costs in Utah as compared to trends in other energy-producing states (kWh or BTU)
- Alignment of Utah's policy and regulatory decisions with OED intervention strategies, proposed solutions, comments, and positions
- Number of regulatory and/or policy issues
 OED is engaged in over the next three years
- Number of jobs potentially created or lost as a result of the policy/regulatory outcome
- Inventory of regulations or rules that were improved to enhance Utah's energy future



Expand Regional Engagement

OED will lead the discussion and analysis of regional proposals in order to advance Utah's interests in affordable, environmentally safe, reliable and resilient electricity systems.

Utah's participation in broadening electricity markets occurs as the sector increasingly includes variable renewable resources; storage at the utility and dispersed scale is becoming economically justifiable; and states and customers are establishing particular generation requirements, (such as greenhouse gas emission limitations). Access to broader electricity markets offers Utah the potential for lower customer costs and expanded markets for generation, but must be implemented in a way that protects Utah's economy and employment.

ACTIONS

- Evaluate the opportunities and risks associated with participation in a regional day-ahead electricity market enabling the State of Utah to make informed decisions resulting in continued energy affordability, reliability, environmentally safe and economic growth
- Continue Western RTO discussions with the California Independent System Operator, Mountain West Transmission Group, Peak Reliability and other potential partners
- Ongoing assessment of function and impact for Utah of the existing Energy Imbalance Market (EIM)
- Represent Utah's interests in regionalization discussions through participation in meetings and written comments
- Collaborate with other Western states to promote sound policy decisions

OED STAFF AND PARTNERS

- · OED team
- Regional organizations, including Western Governors' Association, Western Electricity Coordinating Council, Western Interstate Energy Board, and the Western Interconnection Regional Advisory Board
- State entities, including the Public Service Commission, Division of Public Utilities, and Office of Consumer Services
- Utilities, including Rocky Mountain Power, Dominion Energy, co-ops, and municipals as represented by UAMPS and UMPA

- The trend of energy production costs in Utah as compared to trends in other energy-producing states (kWh or BTU)
- · Installed capacity of renewable energy
- · Installed capacity of energy storage
- Estimated economic benefit of EIM participation



Increase All-of-the-Above Energy Communications

This goal supports efforts to support increased local, regional, national and international awareness of Utah's energy and mineral diversity. Through strategic and targeted communications, including enhanced website development, press and advertising campaigns and foreign trade missions over the next three years.

ACTIONS

- Launch a new energy.utah.gov website that will offer an interactive hub for business development, education, news and events
- Organize a multichannel communications initiative that will include:
 - Creation and disbursement of OED, partner and industry press releases
 - Targeted media pitches to county, state, regional and national news outlets on Utah's energy and minerals opportunities and successes
 - Creation of new investment-driven printed materials for strategic meetings and elevating OED's incentive programs
 - Strategic advertising campaigns to promote energy and minerals development opportunities to targeted industries both national and international
- Annual energy and minerals trade mission to drive international research partnerships, foreign direct investment and event speakers/sponsors/attendees
- Targeted engagement with visiting delegations to Utah
- Identify two opportunities annually for Governor's Energy Advisor to speak at foreign energy & minerals conferences
- · Deliver an OED Annual Report

OED STAFF AND PARTNERS

- · OED Communications Director
- Private web/advertising/marketing agency
- · SpyHop Phase II Productions
- · State Agencies
- · County Commissions
- Foreign state and industry offices
- Federal Partners

- Website analytics (traffic, specific pages, demographics, length of stay, etc.)
- Advertising analytics across social media, print and broadcast campaigns
- · Number of press releases delivered
- Number of press articles featuring Utah energy and minerals
- Number of companies engaged in foreign trade missions
- Number of companies engaged in local delegation visits
- Number of international agreements and action plans (MOUs such as Jordan and Israel)
- Number of international speeches and attendees addressed



Advance the Air-Energy Nexus

Affordable, reliable energy plays an important role in securing improvement in our air quality. Through the deployment of advanced energy systems, new transportation alternatives, cleaner fuels, building efficiencies and education, Utah can continue to drive improvement in our airshed. OED will engage with strategic partners such as the Utah Clean Air Partnership, Envision Utah, and Utah Clean Cities Coalition to improve understanding of the impact of energy on air quality. This leadership will include targeted educational opportunities for a variety of public audiences, developing educational content for events and outreach and elevating OED's work and its connection to air quality. OED will work to identify opportunities that improve air quality outcomes while maintaining its all-of-the-above approach to energy and minerals development.

ACTIONS

- Develop two K-12 lesson plan designed to teach students about the air-energy nexus
- Work with strategic partners to develop educational panel on air-energy topics at the 2018 Governor's Energy Summit and a partner event
- Provide targeted communications that describe how OED programs, policies and industrial assistance has positively impacted air quality
- Work with Point of the Mountain Development Commission to develop innovative, multi-modal transportation solutions to improve air quality and alleviate traffic congestion
- Support innovations in new energy technologies that result in reduced emissions, including pilot projects in partnership with Rocky Mountain Power's STEP initiative
- Participate annually in the Salt Lake Chamber Clear the Air Challenge
- Become one of the Salt Lake Chamber's "Clean Air Champions"
- Partner with Rocky Mountain Power and Dominion Energy to enhance air energy

- public outreach and coordinate on programs with a target to deliver two coordinated public messages annually
- Pursue funding opportunities for air quality improvement initiatives

OED STAFF AND PARTNERS

- · OED team
- · Utah Clean Air Partnership
- · Utah Clean Cities Coalition
- · Utah Division of Air Quality
- · Utah Clean Air Caucus
- · Utah Clean Energy
- · Living Zenith
- · Building Owners and Managers Association
- · Envision Utah
- · Point of the Mountain Development Commission
- · Leaders for Clean Air
- U Drives Electric
- Utah Department of Environmental Quality
- Dominion Energy
- Andeaver
- · Chevron
- · Rocky Mountain Power
- Salt Lake Chamber (Natural Resources Business Council)

- · Number of red air days
- · Air pollutant emissions
- Number of people educated on the air-energy nexus
- Number of teachers/classrooms engaged
- · Number of air-energy educational events
- Delivery of cleaner, Tier 3 fuels to Utah markets leveraging OED-administered High Cost Infrastructure Tax Credit

